PROPOSED

PERMIT APPLICATION REVIEW
TEMPORARY COVERED SOURCE PERMIT No. 0380-01-CT
Renewal Application No. 0380-02

Applicant: Goodfellow Brothers, Inc. dba Rimrock Paving Company

Mailing Address: P.O. Box 220, Kihei, Hawaii 96753-0220

Located at: Various Temporary Sites, Maui and Other Islands of Hawaii
Initial Location: Puunene Quarry, Mokulele Highway, Puunene, Maui

Coordinates: UTM: 765,400 meters East and 2,303,907 meters North

Equipment:
1) 174 TPH ASTEC, model PDM-630-C portable drum mixer/dryer with 76 MMBtu/hr Hauck Starjet burner, model no. SJ-360;
2) Knock-out box;
3) Venturi scrubber with demister;
4) 1,100 kW Catepillar diesel engine generator, model no. 3512, serial no. 24Z01234;
5) 75 Ton HMA storage silo;
6) 30 Ton HMA storage silo;
7) Three (3) compartment cold feed system (BIN), model no. PCF-810-3; and
8) Conveyor system.

Responsible Official:	Mr. Daniel R. Goodfellow	**Contact:**	Mr. Ted Fritzen
Title:	Vice President	**Title:**	Permit Administrator
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1. Background.

1.1 Goodfellow Brothers, Inc. has submitted an application to renew their temporary covered source permit for an existing 174 TPH portable drum mix hot mix asphalt (HMA) plant to operate at various locations on Maui and possibly other Islands. For information, the plant has not moved since the initial covered source permit was issued on November 12, 1998. Failure to move the plant within a five year period is in conflict with what is considered a temporary covered source as defined in Hawaii Administrative Rules (HAR) §11-60.1-81. The plant is typically powered from electricity supplied by the electric company. Power, if necessary, will also be supplied from a 1,100 kW diesel engine generator. The Standard Industrial Classification Code for this plant is 2951 (Asphalt Paving Mixtures and Blocks). For the permit renewal, the applicant proposes the following modifications:

a. Replace the LP-99 (Caterpillar model no. 3412 - 455 kW) diesel engine generator operated at 2,700 hr/yr with an LP-84 (Caterpillar model no. 3512 - 1,100 kW) diesel engine generator operated at 1,500 hours/year;

b. Add cooking oil as an alternate fuel fired by the drum mixer/dryer; and

c. Limit the operating hours of the drum mixer/dryer from 2,700 hours/year to 2,250 hours/year.

1.2 Mr. Ted Fritzen indicated the following:

a. The sulfur content of the fuel oil No. 2 is monitored with statements from the supplier that include the purchase invoice.

b. The number of gallons of fuel oil No. 2 and cooking oil consumed are tracked with purchase invoices and entered into a spread sheet.

c. Cooking oil for the drum mixer/dryer is supplied from Pacific Biodiesel. The contact is Bob King at (808) 877-3144.

1.3 Pacific Biodiesel personnel disclosed the following information:

a. The cooking oil is processed by removing solids, noncombustible material, and water from used restaurant fryer oil.

b. Biodiesel is cooking oil that has been further processed by removing glycerin (a soap substance in the restaurant fryer oil).

c. There is virtually no sulfur in the cooking oil processed.

2. Applicable Requirements:

2.1 See permit application review 0380-01 for applicability to the Hawaii Administrative Rules and federal regulations.

2.2 The facility will be placed into the Compliance Data System (CDS) because Goodfellow Brothers, Inc. is a covered source.

2.3 Because the facility is a covered source, annual emissions reporting is required.

2.4 The facility is not a major covered source. Fugitive emissions were included in the major source determination because this facility is subject to New Source Performance Standards (NSPS).

2.5 The facility is not a major source for hazardous air pollutants (HAPs) and is not subject to National Emissions Standards for HAPS or Maximum Achievable Control Technology (MACT) standards under 40 CFR Parts 61 or 63.

2.6 Prevention of Significant Deterioration (PSD) review applies to new major stationary sources and major modifications to these types of sources. This is not a major source; therefore, PSD review does not apply.

2.7 The 174 TPH asphalt plant is a synthetic minor source because operation at 8,760 hr/yr triggers major source thresholds for NO_X and CO (see Paragraph 6.8).

2.8 A Best Available Control Technology (BACT) analysis is required for new sources or modifications to existing sources that would result in a net emissions increase above significant levels as defined in HAR, Section 11-60.1-1. BACT is not applicable to this facility because the net increase in emissions does not exceed significant levels as shown in the table below:

Net Emissions Change (Potential to Actual)				
Pollutant	**2002/2003 Actual Average Emissions (TPY)**	**Potential Emissions For Modifications (TPY)[a]**	**Net Emissions Change (TPY)**	**Significant Level**
SO_2	1.00	6.300	5.300	100
NO_x	2.00	38.764	36.764	40
CO	2.70	32.427	29.727	40
PM	1.00	7.032	6.032	25
PM-10	1.00	6.930	5.930	15
VOC	1.50	7.003	5.503	40

a: Modifications are the replacement of a 455 kW diesel engine generator operated at 2,700 hr/yr with a 1,100 kW diesel engine generator operated at 1,500 hr/yr, to burn cooking oil as an alternate fuel in the drum mixer/dryer, and a reduction in operating hours for drum mixer/dryer from 2,700 hr/yr to 2,250 hr/yr.

2.9 The purpose of Compliance Assurance Monitoring (CAM) is to provide reasonable assurance that compliance is being achieved with large emission units that rely on air pollution control device equipment to meet an emissions limit or standard. Pursuant to 40 Code of Federal Regulations, Part 64, for CAM to be applicable, the emissions unit must: (1) be located at a major source; (2) be subject to an emissions limit or standard; (3) use a control device to achieve compliance; (4) have potential precontrol emissions that are greater than the major source level; and (5) not otherwise be exempt from CAM. Although the drum mix HMA plant relies on a venturi scrubber to achieve compliance with the federal particulate standard required by 40 CFR 60, Subpart I and has potential precontrol emission greater than the major source level for particulate matter, CAM is not applicable to the drum mixer/dryer because the plant is not a major source.

2.10 The Consolidated Emissions Reporting Rule (CERR) is not applicable because emissions from the facility (For CERR applicability, the facility is a point source) do not exceed reporting levels pursuant to 40 CFR 51, Subpart A (see table below):

Pollutant	[a] Facility Emissions (TPY)	CERR Triggering Levels (TPY)	
		1 year cycle (type A sources)	3 year cycle (type B sources)
PM-10	12.140	≥ 250	≥ 100
SO_2	6.300	≥ 2,500	≥ 100
NO_x	38.764	≥ 2,500	≥ 100
VOC	10.205	≥ 250	≥ 100
CO	32.922	≥ 2,500	≥ 1,000

3. Insignificant Activities/Exemptions

3.1 See permit application review 0380-01 for a description of insignificant activities.

4. Alternative Operating Scenarios

4.1 There were no proposed alternate operating scenarios for the drum mix HMA plant.

5. Air Pollution Controls

5.1 Control of particulate matter from the gas stream of the portable drum mixer is initially provided by a knock-out box (settling chamber), comprised of an enlarged area of duct-work at the end of the drum mixer that slows the velocity of the gas stream to allow the larger heavier particles to settle within the drum mixer. The manufacturer of the equipment, ASTEC Industries, Inc., indicates that the knock-out box is capable of removing 85% by weight of the total particles suspended by the gas stream.

5.2 The remaining 15% by weight of total suspended particulate matter generated inside the portable drum mixer is controlled by a venturi scrubber. These smaller lighter particles pass through the venturi and captured in water that is sheared by the gas stream. Although the venturi scrubber can achieve a 98% control efficiency, design parameters for this particular plant, due to space limitations, result in a maximum 90% particulate collection efficiency. Water for the scrubber is drawn from a settling pond. As the gas stream passes through the venturi, particulate containing droplets are removed by a demister. The scrubber water with collected particles is ultimately discharged from the demister back into the settling pond.

5.3 Fugitive dust emissions around the work yard and stockpiles will be controlled by a water spray truck.

6. Project Emissions

6.1 The applicant's consultant used emission factors from AP-42 Section 11.1 (12/00), "Hot Mix Asphalt Plants" to determine emissions from the drum mixer/dryer. Emission rates were based on the maximum capacity of the drum mixer to process 174 TPH of HMA, 2,250 hr/yr operation, and the firing of diesel fuel or cooking oil. It was assumed that cooking oil will generate more NO_x and less SO_2, CO, PM, and VOC than fuel oil No. 2 based on source testing an HC&S boiler fired on cooking oil. Emissions with additional assumptions for their determination are shown in Enclosures (1) and (2) and summarized below as follows:

174 TPH Drum Mixer/Dryer Emissions			
Pollutant	Emission Rate (lb/hr)/(g/s)	Emission Rate (TPY) [2,250 hr/yr]	Emission Rate (TPY) [8,760 hr/yr]
PM	5.742/0.725	6.460	25.150
PM-10	5.742/0.725	6.460	25.150
CO	22.620/2.856	25.448	99.076
NO_x	11.101/1.402	12.489	48.622
SO_2	1.914/0.242	2.153	8.383
VOC	----------	6.264	24.388
HAPs	---------	2.435	9.481

6.2 The Clean Air Branch (CAB) used emission factors from AP-42 Section 11.1 (12/00), "Hot Mix Asphalt Plants" to determine emissions from loading HMA into trucks for delivery. Emission rates were based on the maximum capacity of the drum mixer to process 174 TPH of HMA and 2,250 hr/yr operation. Emissions and assumptions are summarized below:

Fugitive Emissions (Plant Load-Out)			
Pollutant	Emission Factor (lb/ton)[a]	Emission Rate (TPY) [2,250 hr/yr]	Emission Rate (TPY) [8,760 hr/yr]
PM	5.22E-04	0.102	0.398
PM-10[b]	5.22E-04	0.102	0.398
VOC	4.16E-03	0.814	3.170
CO	1.35E-03	0.264	1.028

a: Default values of 325 °F (T) and 0.5 loss-on-heating (V) were assumed for emission factors.

b: Assumed that PM-10 equals PM emissions.

6.3 The Clean Air Branch (CAB) used emission factors from AP-42 Section 11.1 (12/00), "Hot Mix Asphalt Plants" to determine emissions from filling silos with HMA. Emission rates were based on the maximum capacity of the drum mixer to process 174 TPH of HMA and 2,250 hr/yr operation. Emissions and assumptions are summarized below:

Fugitive Emissions (Silo Filling)			
Pollutant	Emission Factor (lb/ton)[a]	Emission Rate (TPY) [2,250 hr/yr]	Emission Rate (TPY) [8,760 hr/yr]
PM	5.86E-04	0.115	0.447
PM-10[b]	5.86E-04	0.115	0.447
VOC	1.22E-02	2.388	9.298
CO	1.18E-03	0.231	0.899

a: Default values of 325 °F (T) and 0.5 loss-on-heating (V) were assumed for emission factors.

b: Assumed that PM-10 equals PM emissions.

6.4 The applicant's consultant used emission factors from AP-42, Section 3.4 (10/96), "Large Stationary Diesel and All Stationary Dual-fuel Engines". Emissions were based on 1,500 hours per year operation, a heating value for diesel of 140,000 Btu/gal, and a maximum 78.2 gallon per hour fuel consumption. Emissions with additional assumption for their determination are shown in Enclosure (3) and summarized below as follows:

1,100 kW Diesel Engine Generator			
Pollutant	Emission Rate (lb/hr)/(g/s)	Emission Rate (TPY) [1,500 hr/yr]	Emission Rate (TPY) [8,760 hr/yr]
PM	0.763/0.096	0.572	3.342
PM-10	0.627/0.079	0.470	2.748
CO	9.306/1.175	6.979	40.759
NO_x	35.034/4.423	26.275	153.447
SO_2	5.529/0.698	4.147	24.216
VOC	----------	0.739	4.316
HAPs	---------	0.011	0.065

6.5 Emission factors to determine fugitive dust from loading/unloading operations and conveyor transfer were obtained from AP-42, Section 11.19.2,(1/95), "Crushed Stone Processing". There have been no revisions to the emission factors since the previous review; therefore, emission rates from the initial permit application review for 2,700 hr/yr operation were factored down accordingly to determine emissions for 2,250 hr/yr and 8,760 hr/yr operation. Particulate emissions are summarized below as follows:

Fugitive Dust (Aggregate Transfer)		
Pollutant	Emission Rate (TPY) [2,250 hr/yr]	Emission Rate (TPY) [8,760 hr/yr]
PM	2.033	7.915
PM-10	0.802	3.122

6.6 Emissions for stockpiles were calculated using AP-42, revision (1/95), Section 13.2.4, "Aggregate Handling and Storage Piles". There have been no revisions to the emission factors since the previous review; therefore, emission rates from the initial permit application review for 2,700 hr/yr operation were factored down accordingly to determine emissions for 2,250 and 8,760 hr/yr operation. Particulate emissions are summarized below as follows:

Fugitive Dust (Stockpiles)		
Pollutant	Emission Rate (TPY) [2,250 hr/yr]	Emission Rate (TPY) [8,760 hr/yr]
PM	5.250	20.440
PM-10	2.483	9.667

6.7 Emissions from vehicle travel on unpaved roads were calculated using AP-42, Section 13.2.2 (9/98), "Unpaved Roads". The AP-42 emission factor equations from this section have been updated since the initial permit application review which used the (1/95) revision. Emission rates were based on the following assumptions:

a. Maximum 10,354 vehicle miles traveled (VMT) factored down by 2,250/2,700 based on information from the previous permit application review for operation of various trucks. The maximum distance after applying the factor is 8,628 VMT.

b. A k (particle size multiplier) value for PM and PM-10 of 10 and 2.6 respectively based on updated information from AP-42;

c. A W (mean vehicle weight) value of 26.8 tons based on information from the initial permit application review for the mean weight of various trucks (includes both tare and gross vehicle weights);

d. An s (silt content of road) value of 10% for stone quarrying and processing plant road;

e. An S (mean vehicle speed) value of 5 miles per hour;

f. An M (surface material moisture content) default value of 0.2;

g. A p (# of days with 0.01 in of rain per year) value of 97 based on available data between years 1954 to 2003 from the Kahului WSO AP 398 station (www.wrcc.dri.edu/cgi-bin);

h. A 70% control efficiency was applied to account for dust control from the water tank truck;

i. A factor of 5/15 was applied to calculate the emission factor to account for the tendency of the emission factor equation to over estimate emissions for speeds less than 15 miles per hour; and

j. Emissions from vehicle travel on unpaved roads are summarized as follows:

Fugitive Dust (Vehicle Travel)			
Pollutant	Emission Factor (lb/VMT)	Emission Rate (TPY) [2,250 hr/yr]	Emission Rate (TPY) [8,760 hr/yr]
PM	6.319	8.178	31.840
PM-10	1.320	1.708	6.650

6.8 Emissions from the facility are shown in the following table:

FACILITY-WIDE EMISSIONS		
Pollutant	Potential Emission (TPY) [Proposed controls at 2,250 hr/yr]	Potential Emission (TPY) [Proposed controls at 8,760 hr/yr]
PM	22.996	89.532
PM-10	12.376	48.182
CO	36.412	141.762
NO_X	51.902	202.069
SO_2	8.813	32.599
VOC	10.574	41.172
HAPs	2.446	9.546

7. Air Quality Assessment

7.1 The applicant's consultant performed an ambient air quality impact analysis (AAQIA) for the modification to replace the 455 kW diesel engine generator with a 1,100 kW diesel engine generator and to burn cooking oil in the drum mixer dryer. A BEE-Line version of the EPA Screen 3 model was used for the analysis. Assumptions for the SCREEN3 model included:

a. Simple terrain impacts;
b. Rural dispersion parameters;
c. Wake effects from the 75 ton silo;
d. Default meteorology;
e. EPA scaling factors of 0.9, 0.7, and 0.4 for the 3-hour, 8-hour, and 24-hour concentrations respectively; and
f. State of Hawaii scaling factor of 0.2 for the annual concentrations.

7.2 The initial receptor for the 1,100 kW diesel engine generator was placed at 1 meter. Another receptor was placed at 100 meters. Thereafter, receptors were incremented every 100 meters to a maximum distance of 500 meters. The maximum one hour concentration of 199.6 ug/m^3 per g/s was predicted at a distance of 57 meters from the diesel engine generator.

7.3 The initial receptor for the drum mixer dryer for the HMA plant was placed at 10 meters. Another receptor was placed at 100 meters. Thereafter, receptors were incremented every 100 meters to a maximum distance of 500 meters. The maximum one hour concentration of 150.6 ug/m^3 per g/s was predicted at a distance of 57 meters from the drum mixer dryer.

7.4 A Good Engineering Practice (GEP) stack height analysis was performed using the dimensions of structures in the vicinity of the stacks of the diesel engine generator and portable drum mixer. Results indicated that the physical stack heights of the diesel engine generator and drum mixer/dryer were less than the GEP formula stack heigh based on the dimensions of the 75 ton silo. Therefore, wake effects from the 75 ton silo were considered for modeling.

7.5 The applicant's consultant used background air quality data from calendar year 1999 from the West Beach monitoring station for SO_2, NO_2, and CO. Background air quality data from calendar year 1999 from the Kihei monitoring station was used for PM-10. CAB used background air quality data obtained by the aforementioned monitoring stations during calendar year 2001 for the AAQIA.

7.6 The table below presents the emission rates and stack parameters for the AAQIA. Lead emissions were considered negligible and not evaluated. There were slight differences between the g/s emission rates obtained by CAB and the applicant's consultant. For the AAQIA, the higher g/s emission rates were used.

SOURCE EMISSION RATES AND STACK PARAMETERS FOR AIR MODELING

SOURCE		EMISSION RATES				STACK PARAMETERS			
Equipment	Stack No.	SO_2 (g/s)	NO_x (g/s)	CO (g/s)	PM_{10} (g/s)	Height (m)	Temp. (K)	Velocity (m/s)	Diameter (m)
1,100 kW Diesel Engine Generator	1	0.698	4.423	1.175	0.079	12.04	756	59.31	0.305
Drum Mixer Dryer	2	0.242	1.402	2.856	0.725	10.80	338	28.08[a]	1.090

a: Velocity based on that calculated from January 21, 2003 correspondence for request to burn alternate fuel.

7.7 The predicted concentrations in the following table assumed 2,250 hr/yr operation. The ozone limiting method was also applied to determine the annual concentration of NO_2. Based on these assumptions, the combined emissions impact from the diesel engine generator and drum mixer/dryer will comply with state and federal ambient air quality standards.

PREDICTED AMBIENT AIR QUALITY IMPACTS

AIR POLLUTANT	AVERAGING TIME	IMPACT STACK 1 (ug/m^3)	IMPACT STACK 2 (ug/m^3)	BACKGROUND (ug/m^3)	TOTAL IMPACT (ug/m^3)	AIR STANDARD (ug/m^3)	PERCENT STANDARD
SO_2	3-Hour	125	33	12	170	1,300	13
	24-Hour	56	15	5	76	365	21
	Annual	5	2	0	7	80	9
NO_2	Annual	30	11	6	47	70	67
CO	1-Hour	235	430	1,026	1,691	10,000	17
	8-Hour	164	301	456	921	5,000	18
PM-10	24-Hour	6	44	93	143	150	95
	Annual	1	6	23	30	50	60

8. Significant Permit Conditions:

8.1 Drum mixer dryer operational limit changed from 2,700 hr/yr to 2,250 hr/yr

8.2 Replace the 455 kW diesel engine generator operated at 2,700 hr/yr with a 1,100 kW diesel engine generator operated at 1,500 hr/yr

8.3 Add cooking oil as an alternate fuel for the drum mixer/dryer

8.4 Update permit conditions as applicable

9. Conclusion and Recommendation

9.1 Actual emissions from the facility should be lower than those estimated because emission rates were based on equipment running at maximum capacity. Equipment is not expected to run at maximum capacity on a continuous basis. Also, the diesel engine generator added to the plant is not expected to operate all the time. The plant obtains most of its power from Maui Electric Company. The drum mixer/dryer is equipped with a venturi scrubber to control particulate matter. Recommend issuing the temporary covered source permit subject to the 30-day public comment period and 45-day review by EPA that will be initiated simultaneously.

Mike Madsen 10-28-2003